Aeon Labs Smart Switch Gen5

(Z-Wave Smart Switch Gen5)

Change history

Revision	Date	Change Description
1	3/13/2014	Initial draft.
2	5/15/2014	Updated Z-wave module to 500 series
3	7/16/2014	Added configuration parameter 20 and 81.

Aeon Labs Smart Switch Gen5
Engineering Specifications and Advanced Functions for Developers
(V3.25)

Aeon Labs Smart Switch is a Z-Wave power binary switch device based on Z-Wave enhanced 232 slave library V6.51.00.

The Smart Switch has 3 Configuration report groups. Configuration report group is differ from ASSOCIATION GROUP. Report group is a group that you can set automatic reports to be sent at a certain interval time. All the reports will be sent at the same time in one Configuration report group. The interval of transmission for each report group can be specified (configurable parameters 111-113). If the Smart Switch does not set association nodes, it will not send automatic reports.

As soon as Smart Switch is removed from a z-wave network it will be restored into default factory setting.

1. Library and Command Classes

1.1 SDK: 6.51.00

1.2 Library
- Basic Device Class: BASIC_TYPE_ROUTING_SLAVE
- Generic Device class: GENERIC_TYPE_SWITCH_BINARY
- Specific Device Class: SPECIFIC_TYPE_POWER_SWITCH_BINARY

1.3 Commands Class

	Included Non-Secure Network	**Included Secure Network**
Node Info Frame	COMMAND_CLASS_ZWAVEPLUS_INFO V2 COMMAND_CLASS_SWITCH_BINARY V1 COMMAND_CLASS_METER V3 COMMAND_CLASS_SWITCH_ALL V1 COMMAND_CLASS_SCENE_ACTUATOR_CONF V1 COMMAND_CLASS_SCENE_ACTIVATION V1 COMMAND_CLASS_CONFIGURATION V1 COMMAND_CLASS_CRC_16_ENCAP V1 COMMAND_CLASS_ASSOCIATION_GRP_INFO V1 COMMAND_CLASS_ASSOCIATION V2 COMMAND_CLASS_MANUFACTURER_SPECIFIC V2 COMMAND_CLASS_VERSION V2 COMMAND_CLASS_FIRMWARE_UPDATE_MD V2 COMMAND_CLASS_POWERLEVEL V1 COMMAND_CLASS_SECURITY V1 COMMAND_CLASS_MARK V1 COMMAND_CLASS_DEVICE_RESET_LOCALLY V1 COMMAND_CLASS_HAIL V1	COMMAND_CLASS_ZWAVEPLUS_INFO V2 COMMAND_CLASS_VERSION V2 COMMAND_CLASS_MANUFACTURER_SPECIFIC V2 COMMAND_CLASS_SECURITY V1 COMMAND_CLASS_CRC_16_ENCAP V1 COMMAND_CLASS_MARK V1 COMMAND_CLASS_DEVICE_RESET_LOCALLY V1 COMMAND_CLASS_HAIL V1
Security Command Supported Report Frame	–	COMMAND_CLASS_SWITCH_BINARY V1 COMMAND_CLASS_METER V3 COMMAND_CLASS_SWITCH_ALL V1 COMMAND_CLASS_SCENE_ACTUATOR_CONF V1 COMMAND_CLASS_SCENE_ACTIVATION V1 COMMAND_CLASS_CONFIGURATION V1 COMMAND_CLASS_CRC_16_ENCAP V1 COMMAND_CLASS_ASSOCIATION_GRP_INFO V1 COMMAND_CLASS_ASSOCIATION V2

		COMMAND_CLASS_MANUFACTURER_SPECIFIC V2
		COMMAND_CLASS_VERSION V2
		COMMAND_CLASS_FIRMWARE_UPDATE_MD V2
		COMMAND_CLASS_POWERLEVEL V1

2. Technical Specifications

Operating distance: Up to 100 ft / 30 meters indoors and 300 ft / 100 meters outdoors.

Input: 120V~, 60Hz. (USA Version)
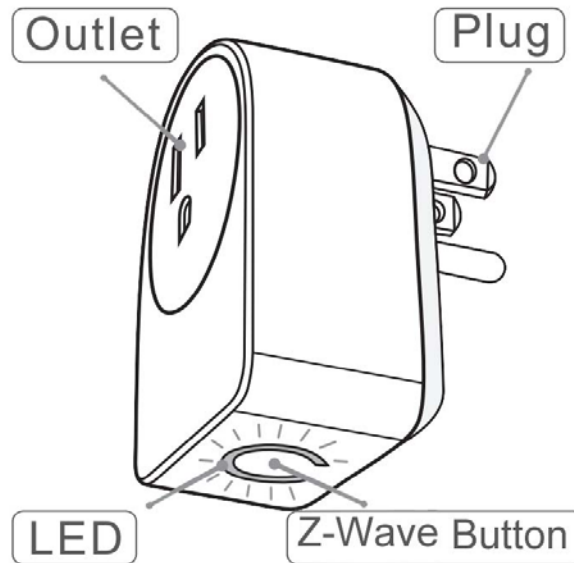
230V~, 50Hz. (EU, AU, BR, CN, IN Version)

Output: 120V~, 60Hz, Max 15A Resistor load. (USA Version）

230V~, 60Hz, Max 16A Resistor load. (EU Version）

230V~, 60Hz, Max 15A Resistor load. (IN Version）

230V~, 60Hz, Max 10A/15A Resistor load. (CN Version）

230V~, 60Hz, Max 10A/15A Resistor load. (AU Version）

230V~, 50Hz, Max 16A Resistor load. (BR version)

Operating temperature: 0 ℃ to 40℃.

Relative humidity: 8-80%

3. Familiarize yourself with your Smart Switch
3.1 Interface

4. All functions of each trigger
4.1 Function of Z-Wave Button

Trigger	Description
Click one time	**Add Smart Switch into an existing z-wave network:** 1. Insert the Smart Switch to power socket, The Smart Switch LED will blink slowly. 2. Let the primary controller into inclusion mode (If you don't know how to do this, refer to its manual). 3. Press the Z-Wave button. 4. If the inclusion success, Smart Switch LED will keep turning on. Otherwise, the LED will

	still blink slowly, in which you need to repeat the process from step 2.
	Remove Smart Switch from an existing z-wave network: 1. Insert the Smart Switch to power socket, The Smart Switch LED will follow the status (on/off) of its load. 2. Let the primary controller of existing Z-Wave network into remove mode (If you don't know how to do this, refer to its manual). 3. Press the Z-Wave button. 4. If the remove success, Smart Switch LED will blink slowly. If Smart Switch LED still follows that of load status, please repeat the process from step 2.
Press and hold 20 seconds	**Reset Smart Switch to factory Default:** 1. Make sure the Smart Switch has been connected to the power supply. 2. Press and hold the Z-wave button for 20 seconds. 3. If holding time more than one second, the LED will blink faster and faster. If holding time more than 20seconds, the LED will be on for 2 seconds, it indicates reset success, otherwise please repeat step 2. **Note:** Reset Smart Switch to factory default settings will: sets the Smart Switch to not in Z-Wave network state; delete the Association setting, power measure value, Scene Configuration Settings and restore the Configuration setting to the default.

5. Special rule of each command

5.1 `Z-Wave Plus Info Report Command Class`

Parameter	Value
Z-Wave Plus Version	1
Role Type	5 (ZWAVEPLUS_INFO_REPORT_ROLE_TYPE_SLAVE_ALWAYS_ON)
Node Type	0 (ZWAVEPLUS_INFO_REPORT_NODE_TYPE_ZWAVEPLUS_NODE)
Installer Icon Type	0x0700 (ICON_TYPE_GENERIC_ON_OFF_POWER_SWITCH)
User Icon Type	0x0700 (ICON_TYPE_GENERIC_ON_OFF_POWER_SWITCH)

5.2 Association Command Class

The Smart Switch supports 2 Association groups.

a. The Node IDs in Group 1 will receive Hail Command /Basic report (configurable) which is sent via single-cast (if there are more than 1 Node ID) when the state of Micro Switch's load changed.

b. The Node IDs in Group 1 will receive Meter REPORT (for watt/ KWH) (configurable) which is sent via single-cast (if there are more than 1 Node ID) when the auto report be setting.

c. When the Smart Switch receives the following commands, it will forward the commands to all node IDs which are in Group 2. The command will be sent via single-cast (if there are more than 1 Node IDs) .
   Commands: Basic Set, Switch Binary Set, Switch Multilevel Start Level Change, Switch Multilevel Stop Level Change, Switch Multilevel Set, Scene Activation Set.

5.3 Association Group Info Command Class
5.3.1 Association Group Info Report Command Class
Profile: General: NA (Profile MSB=0,Profile LSB=0)

5.3.2 Association Group Name Report Command Class
Group 1 ：Lifeline
Group 2：RetransmitSwitchCC

5.4 Scene Actuator Conf Command Class
The Smart Switch supports max 255 Scene ID.

The Scene Actuator Conf Set command is effective, when only Level>=0 and Level<0x64 or Level=0xff, otherwise, it will be ignored.

The Scene Actuator Configuration Get Command is used to request the settings for a given scene, if scene ID is not setting, it will be ignored. If the scene ID setting Dimming Duration = 0xff then Dimming Duration=0 else Dimming Duration= settings value. If Scene ID =0, then the Smart Switch will report currently the activated scene settings. If the currently activated scene settings do not exist, the Micro Switch will reports Level = currently load status and Dimming Duration=0

5.5 Scene Activation Set Command Class
The Scene Activation Set Command is effective, when only Level>=0 and Level<0x64 or Level=0xff, otherwise, it will be ignored. If the requested Scene ID is not configured, it will be ignored too.

5.6 Configuration Set Command Class

7	6	5	4	3	2	1	0
Command Class = COMMAND_CLASS_CONFIGURATION							
Command = CONFIGURATION_SET							
Parameter Number							
Default	Reserved				Size		
Configuration Value 1(MSB)							
Configuration Value 2							
…………							
Configuration Value n(LSB)							

Parameter Number Definitions (8 bit):

Parameter Number Hex / Decimal	Description	Default Value	Size

0x02 (2)	Make Smart Switch blink. Configuration Value 1：1-255 Configuration Value 1 is to Specify the time that Smart Switch need blink, The unit is Second; Configuration Value 2：1-255 Configuration Value 2 is to Specify the Cycle of on/off, the unit of it is 0.1 second. For example: if we set Configuration Value 1 to '15',Configuration Value 2 to '10',then Smart Switch will open 0.5 second, close 0.5 second, and repeat for 14 times.	0x0f0a	2
0x03 (3)	Current Overload Protection. Load will be closed when the Current overrun (US: 15.5A, other country: 16.2A) and the time more than 2 minutes (0=disabled, 1=enabled).	0	1
0x14 (20)	Configure the output load status after re-power on (0=last status, 1=always on, 2=always off)	0	1
0x50 (80)	Enable to send notifications to associated devices (Group 1) when the state of Micro Switch's load changed (0=nothing, 1=hail CC, 2=basic CC report).	0	1
0x51 (81)	Configure the state of red LED: 0: The LED will follow the status (on/off) of its load. 1: When the state of Switch's load changed, The LED will follow the status (on/off) of its load, but the red LED will turn off after 5 seconds if there is no any switch action.	0	1
0x5A (90)	Enables/disables parameter 91 and 92 below (1=enabled, 0=disabled).	1	1
0x5B (91)	The value here represents minimum change in wattage (in terms of wattage) for a REPORT to be sent (Valid values 0-60000).	25（W）	2
0x5C (92)	The value here represents minimum change in wattage percent (in terms of percentage) for a REPORT to be sent (Valid values 0-100).	5（%）	1
0x64 (100)	Set 101-103 to default.	N/A	1

0x65 (101)	Which reports need to send in Report group 1 (See flags in table below).	0x00 00 00 04	4
0x66 (102)	Which reports need to send in Report group 2 (See flags in table below).	0x00 00 00 08	4
0x67 (103)	Which reports need to send in Report group 3 (See flags in table below).	0	4
0x6E (110)	Set 111-113 to default.	N/A	1
0x6F (111)	The time interval of sending Report group 1 (Valid values 0x01-0xFFFFFFFF).	0x00 00 00 03	4
0x70 (112)	The time interval of sending Report group 2 (Valid values 0x01-0xFFFFFFFF).	0x00 00 02 58	4
0x71 (113)	The time interval of sending Report group 3 (Valid values 0x01-0xFFFFFFFF).	0x00 00 02 58	4
0xC8 (200)	Partner ID (0= Aeon Labs Standard Product, 1= AT&T).	0	1
0xFC (252)	Enable/disable Configuration Locked (0 =disable, 1 = enable).	0	1
0xFE (254)	Device Tag.	0	2
0xFF (255)	Reset configuration set up to default setting.	N/A	1

Configuration Values for parameter 101-103：

	7	6	5	4	3	2	1	0
configuration Value 1(MSB)	Reserved							
configuration Value 2	Reserved							
configuration Value 3	Reserved							

configuration Value 4(LSB)	Reserved	Reserved	Reserved	Reserved	Auto send Meter REPORT (for kWh) at the group time interval	Auto send Meter REPORT (for watt) at the group time interval	Auto send Meter REPORT (for current) at the group time interval	Auto send Meter REPORT (for voltage at the group time interval

Example:

a. Automatically report Meter CC (Watts) to node "1" every 12 minutes

1. Set report group 1 send Meter CC (Watts) automatically

ZW_SendData(0x70, 0x04, 0x65, 0x04, 0x00,0x00,0x00,0x04);

2. Set the interval of sending report group 1

ZW_SendData(0x70, 0x04, 0x6F, 0x04, 0x00,0x00,0x02,0xd0);

3. Associate to node "1"

ZW_SendData(0x85, 0x01, 0x01, 0x01);

b. Set default values

ZW_SendData(0x70, 0x04, 0x255,0x01,0x00);